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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/698,217

10/31/2003

Bhima Rao Vijayendran

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EXAMINER

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ART UNIT

PAPER NUMBER

1731

DATE MAILED: 07/10/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/698,217

Applicant(s)

VIJAYENDRAN ET AL.

Examiner

Dennis Cordray

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 23 May 2006.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-36 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-36 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

## **DETAILED ACTION**

### ***Terminal Disclaimer***

The terminal disclaimer filed on 6/15/2006 disclaiming the terminal portion of any patent granted on this application which would extend beyond the expiration date of U.S. Patent No. 6719882 has been reviewed and is accepted. The terminal disclaimer has been recorded.

### ***Claim Objections***

Claims 10, 14-16, 18-19, 22-23, 28-30 and 32-36 are objected to because of the following informalities: The word "claime d" should be changed to "claimed."

Appropriate correction is required.

### ***Claim Rejections - 35 USC § 103***

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Claims 1-9, 20, 22-23, 25-26 and 34-36 are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Riebel et al (5635123).

Claims 1, 3-6, 8, 26 and 34-36: Riebel et al discloses a composite comprising a cellulosic material, a legume-based thermosetting resin and a synthetic resin as a secondary binder (Abstract). Riebel et al also discloses that the legume can be soy protein in flour or isolate form (col 8, lines 23- 29), and that the synthetic resin can be an

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isocyanate or phenolic resin (col 12, lines 1-4). Reibel discloses that the legume protein molecules are hydrolyzed (col 16, lines 37-44). Riebel et al further discloses that the legume-based resin is preferably present in an amount from about 40% to about 56% (col 5, lines 37-41; col 12, lines 1-4 and 45-47). Riebel et al discloses that the secondary binder can be preferably used in an amount from about 2 to about 20% of the dry composite particles. The use of preferably and about indicate that, in some embodiments, the amount of the legume-based resin in the binder composition can be below 40% by weight of the composite and that the amount of the secondary binder can be slightly below 2% by weight of the composite without significantly affecting the results, thus embodiments wherein the total resin composition can be less than 40% by weight of the composite are envisioned.

Claim 2: Riebel et al discloses that the moisture content of the composite is between 3 and 20% prior to pressure forming a product (col 6, lines 43-48).

Claim 7: Riebel et al discloses that the leguminous material can be in various forms (e.g.-a flour, an isolate) (col 8, lines 23-29). The instant specification recites no particular advantage in using a 50:50 mixture of flour and isolate, thus it would have been obvious to one of ordinary skill in the art to use any mixture, including a 50:50 mixture, as a functionally equivalent option.

Claim 9: Riebel et al teaches that is well known to use a phenol formaldehyde resin in fiberboard, particle board and panel board (col 1, lines 46-53).

Claims 20 and 22-23: Riebel et al discloses that a silicone defoaming agent can be added to the legume-based resin in an amount less than 8% by weight of the resin (col 10, lines 44 and 56-63), which encompasses the claimed range.

Claim 25: Riebel et al discloses that the finished board stock can be used as a laminate (col 14, lines 44-49). Reibel also discloses that the raw product is subject to surface finishing steps to produce a final finished product. It is well known to add a laminate overlay to particle board as a surface finish to produce a finished product (i.e.- laminated countertops, wall panel board).

2. Claims 10-13 and 28-31 are rejected under 35 U.S.C. 103(a) as being unpatentable over Riebel et al in view of Clay et al (Rheological Study of Soy-Based PRF Wood Adhesives, Proceedings of the SPE 57<sup>th</sup> Annual Technical Conference & Exhibits, May 2-6, 1999, pp 1298-1304) and Hse et al (Development of Resins Co-Reacted with Soy Flour Hydrolyzate, Biographies and Abstracts, Forest Products Society 54<sup>th</sup> Annual Meeting, June 18-21, 2000, p 22).

Riebel et al does not disclose the claimed ranges of protein hydrosylates to phenolic resin (secondary binder). Clay et al teaches that soy protein isolate in combination with a phenolic resin is a useful binder for joining lumber (p 1298, Abstract). Clay et al also teaches that soy hydrosylates are excellent co-binders when used at a level of 50% of an adhesive mixture (p 1298, Background, 2<sup>nd</sup> par). The adhesives bond green lumber, set rapidly, have excellent water resistance and reduced formaldehyde emissions. Hse et al teaches phenolic adhesives substituted with up to 30% soy hydrosylate for use with OSB panels (p 22).

The art of Riebel et al, Clay et al, Hse et al and the instant invention are analogous as pertaining to binders and glues comprising soy hydrosylates and synthetic resins. It would have been obvious to a person of ordinary skill in the art to use a soy hydrosylate and phenolic resin mixture in the claimed ranges in the product of Riebel et al in view of Clay et al and Hse et al to obtain rapid setting, good water resistance and reduced formaldehyde emissions.

3. Claims 14 and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Riebel et al in view of Holmberg et al (4357454).

Riebel et al teaches that is well known to use a phenol formaldehyde resin in fiberboard, particle board and panel board but does not disclose that the resin comprises paraformaldehyde.

Holmberg et al discloses a binder composition comprising phenol formaldehyde that can be used with cellulosic material, such as wood chips (Abstract and col 2, lines 32-36). Holmberg et al also discloses that the aldehyde can be either formaldehyde or paraformaldehyde (col 2, lines 56-61).

There is no guidance in the instant specification that indicates any advantage in using paraformaldehyde over formaldehyde in the phenolic resin, only that paraformaldehyde is optional (p 4, par 13).

The art of Riebel et al, Holmberg et al and the instant invention are analogous as being directed to composites comprising cellulosic materials and resin binders. It would have been obvious to one of ordinary skill in the art to use paraformaldehyde in the

claimed concentration range in the composition of Riebel et al in view of Holmberg et al as a functionally equivalent option.

4. Claims 16-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Riebel et al in view of Hse (Chung-Yun Hse, "Development of Phenolic Resins Co-reacted with Soy Flour Hydrozylate," Biographies and Abstracts, Forest Products Society 54<sup>th</sup> Annual Meeting, June 18-21, 2000, p22) and further in view of Wynstra et al (4182696).

Riebel et al does not disclose high methylol content phenol formaldehyde pre-polymer.

Hse discloses an OSB panel having an adhesive comprising a soy protein hydrozylate, caustic, formaldehyde and phenol. The molar ratio of formaldehyde to phenol to caustic is 1.65:1:0.65, which is similar to the disclosed composition. Hse does not disclose a high methylol content phenol formaldehyde pre-polymer.

Wynstra et al discloses a thermosetting resin molding composition comprising a fibrous material, phenol, formaldehyde and a base catalyst (col 1, lines 17-20 and col 2, lines 7-14). Wynstra et al also discloses that, under alkaline conditions, phenol and formaldehyde condense to form methylols and that a high formaldehyde to phenol mole ratio is typically used (col 1, lines 17-40). Wynstra et al further discloses that historically the process is carried out to convert substantially all of the formaldehyde to methylol (col 1, lines 41-45).

There is no guidance in the instant specification that indicates any advantage in using high methylol content phenol formaldehyde pre-polymer of any particular

concentration in the phenolic resin, only that the use of high methylol content phenol formaldehyde pre-polymer is optional (p 4, par 14).

The art of Riebel et al, Hse, Wynstra et al and the instant invention are analogous as being directed to composites comprising cellulosic materials and resin binders. It would have been obvious to one of ordinary skill in the art at the time of the invention to use the claimed formaldehyde:phenol:caustic ratio and obtain a high methylol content phenol formaldehyde pre-polymer in the claimed concentration range in the composition of Riebel et al in view of Hse and further in view of Wynstra et al as a well known and functionally equivalent option.

5. Claim 21 is rejected under 35 U.S.C. 103(a) as being unpatentable over Riebel et al in view of Blizzard (4423095).

Riebel et al does not disclose coating the composite with a silicone or silane.

Blizzard discloses a silicone coating composition useful for coating a substrate to provide a water resistant coating (Abstract). The art of Riebel et al, Blizzard and the instant invention are analogous as they pertain to making water resistant materials. It would have been obvious to one skilled in the art at the time of the invention to apply a silicone coating to the composite of Riebel et al in view of Blizzard to make the composite more water resistant.

6. Claim 24 is rejected under 35 U.S.C. 103(a) as being unpatentable over Riebel et al in view of Roubicek et al (3303089).

Riebel et al does not disclose felting to make a low-moisture mat.



Roubicek et al teaches that felting is a standard process used to produce hardboard (col 1, lines 42-43 and 57-58). The art of Riebel et al, Roubicek et al and the instant invention are analogous as they pertain to the formation of cellulosic and resin composites. It would have been obvious to one skilled in the art at the time of the invention to use felting to produce a low-moisture mat prior to molding the composite of Riebel et al in view of Roubicek et al as a standard and well known process.

7. Claims 27 and 32-33 are rejected under 35 U.S.C. 103(a) as being unpatentable over Riebel et al in view of Johns (4376745).

Riebel et al does not disclose that the isocyanate resin is polymeric. Riebel et al also does not disclose that the resin can be a combination of phenolic resin and isocyanate resin.

Johns discloses that a commercially popular resin for use in making particle boards is a polymeric isocyanate (col 1, lines 27-28). Johns also discloses that phenolic resins, although inexpensive, have a slow cure and require resin in excess of that normally necessary to overcome the swelling tendency of cellulose when exposed to moisture and caustic. Isocyanic resins are fast curing and can be used at approximately half of the rate of application of phenolic resins to achieve the same strength, but are expensive. The art of Riebel et al, Johns and the instant invention are analogous as being directed to the binding of cellulose materials. It would have been obvious to one of ordinary skill in the art at the time of the invention to use a polymeric isocyanate resin in the composition of Riebel et al in view of Johns as a well known

functional equivalent. It would also have been obvious to use a combination of phenolic and isocyanate resins to optimize cost and strength properties of the composite.

### ***Response to Arguments***

Applicant's arguments filed 5/23/2006 have been fully considered but they are not persuasive.

Applicant argues that the amended claims requiring the resin binder to be present in an amount less than 40% by weight of the composite overcomes the rejection over Riebel et al. Applicant argues that, since Riebel et al discloses the use of a legume-based resin in an amount of about 40% to about 56% of the composite and a secondary synthetic resin coating in an amount of about 2 to about 20% of the composite, the total amount of binder resins disclosed by Riebel et al is greater than 40%.

Riebel et al discloses that the legume-based resin is preferably present in an amount from about 40% to about 56%. Riebel et al also discloses that the secondary binder can be preferably used in an amount from about 2 to about 20% of the dry composite particles (col 5, lines 37-41; col 12, lines 1-4 and 45-47). Although the preferred amount of binder is greater than 40%, the use of "preferably" indicates that, in some embodiments, the amount of the legume-based resin in the binder composition can be below 40% by weight of the composite and that the amount of the secondary binder can be below 2% by weight of the composite without significantly affecting the results. Also the use of "about" indicates that the preferred lower limits can be less than 40% for the legume-based resin and less than 2% for the secondary synthetic resin.

For example, 36% could be considered about 40% and 1.5% could be considered about 2%.

### ***Conclusion***

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dennis Cordray whose telephone number is 571-272-8244. The examiner can normally be reached on M - F, 7:30 -4:00 PM.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Steven Griffin can be reached on 571-272-1189. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.



DRC



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